(No Model.) 2 Sheets—Sheet 1.

R. I. BROWN.

BELTING FOR TRANSMISSION OF POWER.

No. 543,123. Patented July 23, 1895.

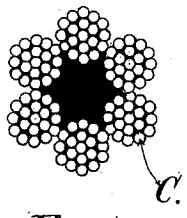

Fig. 1.

Fig. 2

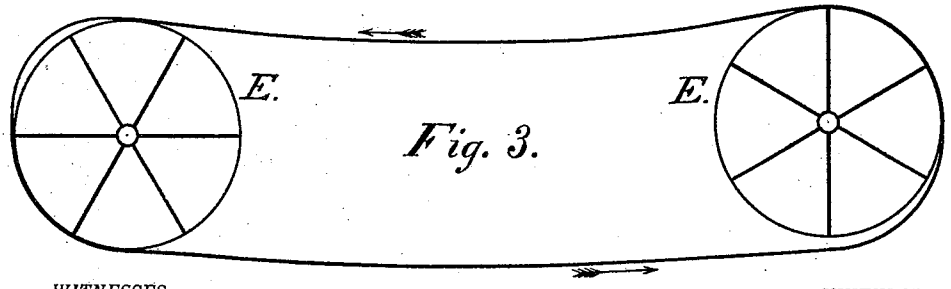

Fig. 3.

WITNESSES:

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INVENTOR

Robt. Dwight Brown

(No Model.) 2 Sheets—Sheet 2.

R. I. BROWN.

BELTING FOR TRANSMISSION OF POWER.

No. 543,123. Patented July 23, 1895.

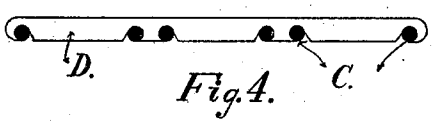

Fig. 4.

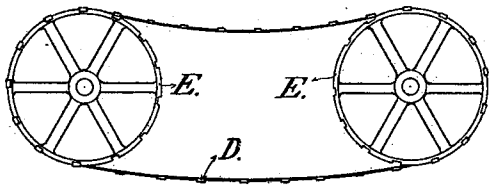

Fig. 7.

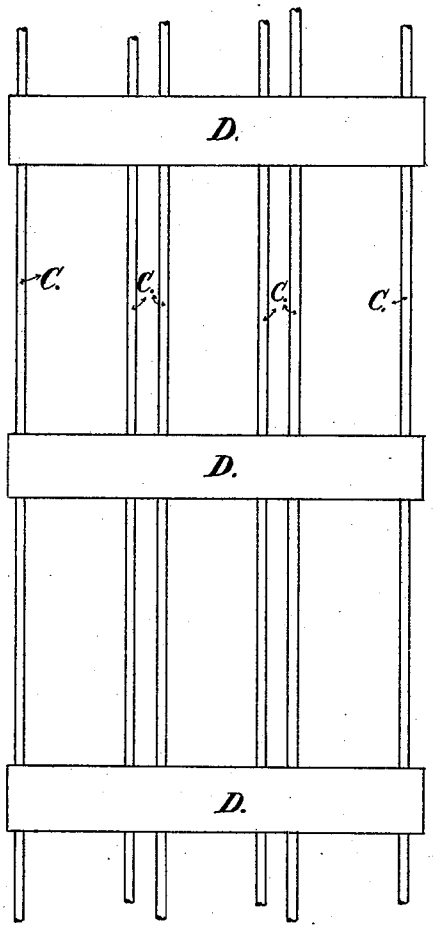

Fig. 5.

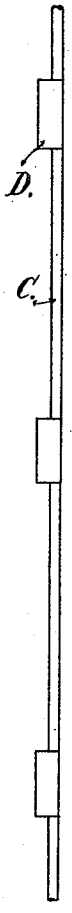

Fig. 6.

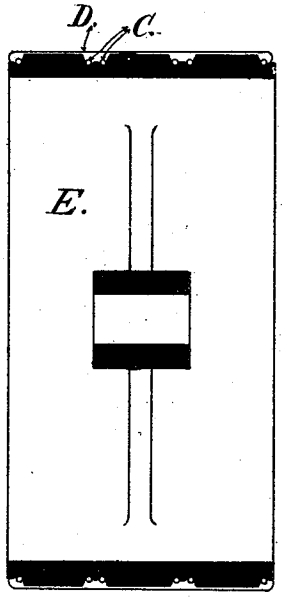

Fig. 8.

WITNESSES:

R. Berlin.

H. P. Greene Jr.

INVENTOR

Robt. Ingram Brown

UNITED STATES PATENT OFFICE.

ROBERT INGM. BROWN, OF NEW YORK, N. Y.

BELTING FOR TRANSMISSION OF POWER.

SPECIFICATION forming part of Letters Patent No. 543,123, dated July 23, 1895.

Application filed August 26, 1891. Serial No. 403,818. (No model.)

To all whom it may concern:

Be it known that I, ROBERT INGRAM BROWN, a citizen of the United States, residing in New York, in the county and State of New York, have invented a new and useful Improvement in Belting for the Transmission of Power, of which the following is a specification.

My invention relates to the use of a flexible metal band passing in an endless circle over wheels, &c., for transmitting power, and the objects of my improvements are, first, to increase the percentage of wear permissible before exceeding the margin of safety; secondly, to reduce the diameter of wheels necessary for easy and rapid flexion of the band when passing around them, and, thirdly, to remove the possibility of slip between the band and wheels while reducing the tension ordinarily given to prevent such slipping; and the means whereby I attain these objects are particularly set forth in the claims hereinafter following.

In the accompanying drawings, forming a part hereof, Figure 1 is a section, and Fig. 2 a side view of the usual method of uniting wires for the transmission of power. Fig. 3 shows their action with small wheels at high speed. Fig. 4 is an end view. Fig. 5 is a top view, and Fig. 6 is a side view, of one manner of arranging and uniting the separate wires for the transmission of power according to my invention. Figs. 7 and 8 show their application with pulleys.

Similar letters refer to similar parts throughout the several views.

When a wire rope is bent in a curve, as around a wheel, each individual wire C, Figs. 1 and 2, slides longitudinally on its neighbor in the endeavor to equalize the strain produced on itself. Otherwise that part of each wire which is in the part of the rope on the outside A, Fig. 2, of the bend would have the most tensile strain, while that on the inside B, Fig. 2, of the bend might even be in compression. This internal sliding friction and resistance to bending a wire rope is an important element in determining the diameter of a wheel. It can be satisfactorily run over or around. In high angular speeds of the wheel it has a very strong tendency to reduce the contact of the wire rope with the wheel, as illustrated in Fig. 3, because the former rides slightly past the wheels E before bending. Consequently, the frictional contact and driving power are reduced To avoid this an otherwise unnecessary tension is usually put on the rope, causing increased friction and wear on the bearings of the wheels or their shafts. Now, if the sides of the rope-groove in the wheel are cut into sprockets and lugs or clips rigidly attached to the rope, so as to engage with the sprockets, the rope cannot slip around the wheel. Where attached these clips must necessarily grip the rope very firmly to prevent their slipping. Consequently, when bending around the wheels the separate strands of the rope are prevented from freely sliding on each other, and this increases the rigidity of the rope, the power taken to operate it, and the diameter of the wheel it should run over; but by reducing the size of the rope and using two or more, parallel and fastened to the same clip, less power will be exhausted in bending, because the sides A and B, Fig. 2, will be nearer the center of the rope, and therefore their tension less unequal, and a wheel of less diameter may be used. The fact still remains that if the ordinary wire rope is made of wires of, say, one-sixteenth of an inch in diameter, and that much (one-sixteenth of an inch) should be worn off the outside of the rope, all the wires would be cut into short pieces and the rope have practically no tensile strength. Yet the one-sixteenth of an inch worn off the outside would be a comparatively small proportion of the total in the rope, the remaining part being worse than useless, as it has required power to keep it in motion and especially to bend it around the wheels.

In my invention, by using single wires C, Figs. 4, 5, 6, and 8, not twisted into a rope, but arranged straight and parallel to each other, fastened or united together at suitable intervals by suitable clips D, which are rigidly attached thereto, Figs. 4, 5, 6, 7, and 8, spacing them as convenient and so that they will all travel on the same pitch line, and are adapted to ride directly on the wheels E, Figs. 7 and 8, the power necessary to bend the belt thus constructed is only that due to the spring of the wires, because, having no frictional contact with each other, they do not slide on each other to equalize the strain on themselves, as

above mentioned, in bending a wire rope of many times the diameter of each wire.

In my invention each wire C stands its full duty in wear throughout its length, except where covered by the clips D, and when worn out there will not be a great mass of metal which was twisted inside and received little wear. Instead, a part of this weight will be retained in the clips, which, however, perform active service in preventing slip on the wheels, but do not consume power to be bent around them. Consequently, where a large wire rope was used at low tensile strain, the size being necessary to give surface contact with the wheel for frictional grip and the whole requiring to be bent, I can use much less wire at a high tensile strain and run it around much smaller wheels, because it will bend so much easier.

In the drawings, Figs. 4, 5, 6, and 7, the wires are shown united by clips, which leave one side of the belt with an uninterrupted smooth surface. This is an important factor where belts are to be crossed or used on idlers or other wheels not recessed for the clips below the riding line of the wires, but it is not necessary to all belts embodying my invention.

Any number of wires may be used. To secure the completest possible freedom from stretch, which stretch would destroy the correct pitch of the cross-bars or clips and make the whole inoperative, and to obtain the maximum use of all the material, and therefore weight that it contains, it is preferable that the wire should be of a uniform section throughout its length, and it should be free from irregularities of grain or fiber caused in the manufacture and from perforations or other reductions of sectional area at places which may be worn or weakened by the use of the belt. For this reason drawn wire is preferable as having the straightest, toughest, and most regular fibers.

Several methods may be used for attaching the clips to the wires and various kinds of wheels utilized, but I prefer those described and claimed in other specifications of mine for Letters Patent.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A belt for the transmission of power composed of two or more wires arranged parallel to each other, and securely united together by means of clips, or other suitable fastening devices, which are rigidly attached to said wires at intervals only of their length and leave the inner face of the belt without projections.

2. A belt for the transmission of power composed of two or more separate, drawn wires arranged parallel to and prevented from having frictional contact with each other, and rigidly united together without materially reducing their sectional area and without projections, in the line of the wire, on the inner face of the belt.

3. A belt for the transmission of power, composed of separate, drawn wires arranged parallel to each other, and securely united together, without materially reducing their sectional area, by means of clips or other suitable fastening devices which are rigidly attached to said wires at intervals of their length, said wires being prevented from having frictional contact with each other and having an uninterrupted side adapted to ride directly on the same pitch line over wheels or pulleys.

ROBT. INGM. BROWN.

Witnesses:
P. NICHOLS,
CHARLES BITTNER.